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ABSTRACT

The Programme Development Fund (PDF) was created to fund the design of distance education courses and programs in New Brunswick. Of the 132 projects funded, 23 were awarded to the private sector, 31 to community colleges, 62 to universities, 12 to non-profit organizations, and 4 to secondary schools. In addition to newly created jobs and the development of more than 167 distance courses, the province has reaped the following benefits from its participation in the program: (1) an increased accessibility to learning opportunities; (2) opportunities to develop multimedia distance learning software; (3) national and international attention; and (4) learning industry contacts outside the province. After the program, PDF recipients evaluated the experience to identify problems and possible improvements. Most problems identified were those of product development, which were due to poor finances, a heavy workload, and administrative problems. Among the recommendations that recipients offered were (1) developers should create and follow a comprehensive business plan and a marketing strategy; (2) team commitment is essential; and (3) enough time should be allowed to overcome technological obstacles. The majority of recipients reported being satisfied with the program procedures and recommend the same form be used in future projects, although some felt that more focus was needed on exportable, possibly profitable projects. (VF)

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ED 430 612

Report on the TeleEducation NB Programme Development Fund 1993 – 1998

by Rory McGreal

Executive Director

September 15 1998

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
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This report is based on work done by Rory McGreal on a doctoral dissertation for Nova Southeastern University.

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Executive Summary

The Programme Development Fund (PDF) was originally created as a $4.1 million fund by TeleEducation NB with the financial support of the Canada/New Brunswick COOPERATION Agreement on Entrepreneurship and Human Resource Development (CAEHRD). The Coordinating Committee of the CAEHRD administered the fund for the federal government represented by the Atlantic Canada Opportunities Agency (ACOA) and for the provincial government by the Regional Development Corporation (RDC).

The PDF supported proposals for the design of distance education courses and programs. The funding was available to any public or private institution, company or organization in New Brunswick. The funding recipients used this assistance to help finance the adaptation and development of course materials for distance education delivery. A peer review committee evaluated the proposals.

This program has benefited the province in the following ways:

- Increased accessibility to quality learning opportunities;
- Provided a major impetus for change within provincial organizations;
- Provided opportunities for institutions to gain experience in developing multimedia distance learning courseware;
- Generated publicity including national and international attention;
- Lead in the promotion of the province's advanced training technology sector;
- Positioned companies with learning industry contacts outside the province;

Highlights of the PDF include:

- More than 167 courses delivered to more than 4 846 students;
- More than 144 full-time positions directly created;

- More than 100 indirectly produced 100 continuing positions in the learning technologies industry that receive no assistance;
- More than 64 working partnerships were created among different public and private sector institutions and companies.

Significantly, only 38% of the funding ($4 414 363) was provided to institutions and companies. They accounted for $7 087 104.80 (62%). The total project commitment was for $11 501 967.80.

Successful NB companies that have received startup funding from the PDF include Scholars.com, which now employs more than 40 people in New Brunswick and Applied Courseware Technologies which employs more than 20 people. CyberDesign founded by NBCC Miramichi graduates now employs more than 20 people. Local training companies like JOT and Amulet were able to branch out into CBT and multimedia development with the aid of the PDF. Other thriving companies like the Pixel Factory and Renaissance Interactive were also given initial boosts by the PDF.

Many PDF Projects completed by public sector institutions have received national and international recognition including NBCC Saint John and Fundy Cable's Registered Nursing Assistant program (DENA) and Université de Moncton`s course *Formation en reconnaisance des acquis* [Training in prior learning assessment] . There are other examples including the delivery of NB courses to France, Vietnam, Trinidad, and China.

PDF recipients identified problems in the development of the projects as well as obstacles in delivering the course at a distance to be the major source of problems. They stressed development problems, which they claimed were due to poor finances, the heavy workload, and problems associated with administration. The delivery problems were

primarily due to irritating technical glitches especially in the early stages of the implementation of the TE-NB network. Marketing was also identified as a major problem area by a significant number of participants. A small number identified difficulties in evaluating their work as being significant.

PDF grant recipients make recommendations based on their experiences. First, they insist that developers must base their strategy on a comprehensive business plan. They further stress the need for a real commitment by the team that is essential for overcoming many of the organizational and logistical problems that can occur. Upgrading the technology can become a serious obstacle, so they recommend building for the future while allowing sufficient time for the project. Finally, they recommend that a good marketing strategy must be developed at the beginning of the project.

The vast majority of the recipients were satisfied with the program procedures.. While some felt that a stronger focus on exportable, potentially profitable projects was needed, they still urged that it be continued in more or less the same form. The PDF has provided NB institutions and companies with a gateway to the new advanced training technologies industry. As a significant component of the province's economic development strategy, it has played a major role in positioning New Brunswick as a world leader in this increasingly important business sector.

Programme Development Fund

Background

This report is based on the experiences of the TeleEducation NB staff, on documentation available including a program review, and on feedback from the recipients of PDF funding in two forms: a formal survey of recipients; and interviews with selected participants. Out of 132 projects financed, survey responses representing 110 projects were received. Five participants were interviewed. Their responses have been edited and included as in Appendix A.

The Programme Development Fund (PDF) was originally created as a $4.1 million fund by TeleEducation NB with the financial support of the Canada/New Brunswick COOPERATION Agreement on Entrepreneurship and Human Resource Development. The Coordinating Committee of the CAEHRD administered the fund for the federal government represented by the Atlantic Canada Opportunities Agency (ACOA) and for the provincial government by the Regional Development Corporation (RDC).

The PDF supported proposals for the design of distance education courses and programs. The funding was available to any public or private institution, company or organization in New Brunswick. The funding recipients used this assistance to help finance the adaptation and development of course materials for distance education delivery. Up to $75 000 was made available for each project. The recipients were responsible for providing at least 50% of the development costs, which has typically been provided as "sweat equity" where the institution donates its labour as an "in-kind" contribution.

A peer review committee was established to evaluate the proposals. It was made up of members recommended by the TeleEducation NB advisory committee. These included French and English speaking representatives mainly from the public sector including the universities, schools, community college, the Department of Economic Development, and ACOA. One representative of the private sector and one representative of the Nursing union were also nominated. The committee's recommendations were sent to the Deputy Minister of Advanced Education and Labour for final approval (Figure 1)

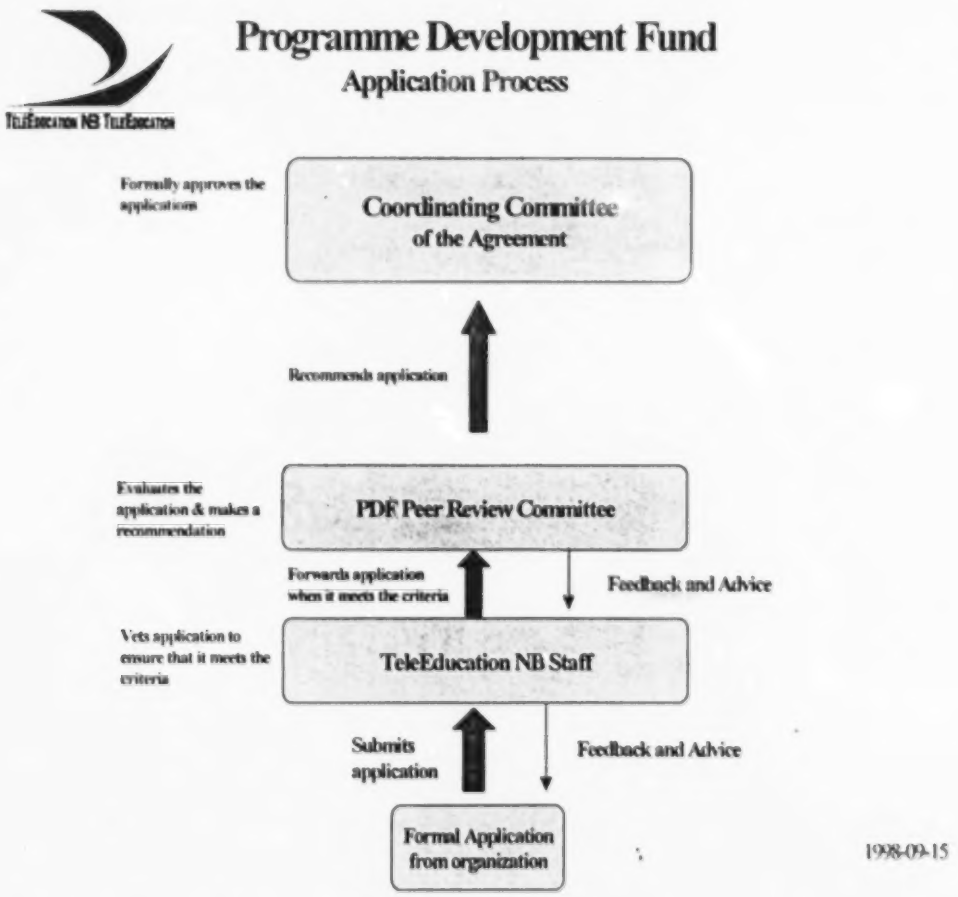

Figure 1. **PDF Review Application Process**

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Projects were selected based on the relative need for the course in New Brunswick as well as its marketability outside the province. Applicants were required to demonstrate knowledge of current professional practice and provide a plan showing that the course or courses supported could lead to a certificate, diploma or degree. Priority was given to the following specific types of applications:

- Academic upgrading for adults (Grades 4 – 12);
- School level projects that provide equity in program delivery to schools;
- Skill development projects related to employment opportunities;
- Public safety, health, childcare, or environment related projects;
- Partnerships within and across sectors;
- Projects that have export potential outside the province;
- Projects that involve course delivery over the Internet.

In addition, the following guidelines for the distribution of funds were recommended by the PDF Peer Review Committee: School level projects: 30%; Post-secondary level projects: 30%; Skill development projects: 30%; Discretionary funds for any kind of project: 10% (Figure 2). Regional and linguistic factors were also taken into account ensuring that there was a reasonable mix between rural and country areas and between the two official linguistic groups. The committee had a responsibility to ensure that different regions of the province and the two language communities received a fair share of the funding. All project applicants had to commit to deliver a course or program in cooperation with the TeleEducation NB network.

TeleEducation NB TeleEducation

Programme Development Fund
1993 - 1997

Project Types

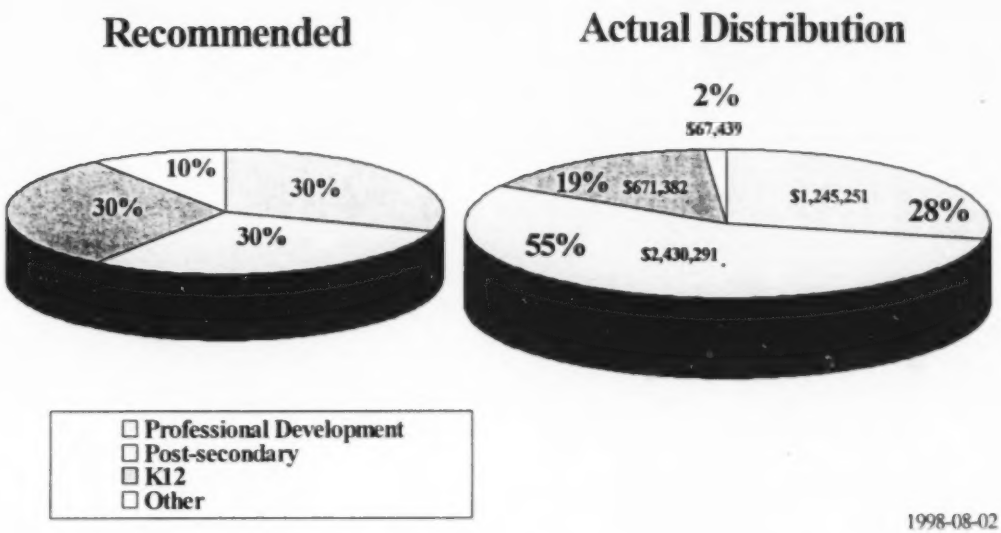

Figure 2. **PDF Project types**

Each application had to include a needs assessment, show the relevance of the project, demonstrate knowledge of current professional practice, and be compatible with the facilities provided by TeleEducation NB. An evaluation plan and commitment to providing quarterly reports was also required. At first, the committee called for proposals twice a year, but later accepted ongoing proposals and met approximately every three months to evaluate those that had been submitted.

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PDF Results

The first iteration of the PDF from 1993 to 1997 was officially completed on March 31, 1997, although a number of projects were still under development. This program, in addition to increasing accessibility to quality learning opportunities throughout the province, has been a major impetus for change within the participating organizations and with those who interact with them. Another common thread has been the gaining of experience in developing multimedia distance learning courseware. As one commentator put it "PDF has built a pool of experience where none existed before." Following from their experiences, companies and institutions have opened up valuable contacts and opportunities nationally and internationally. The publicity generated from the volume of activity in course development has attracted international attention to the province, and its advanced training technology industry. The PDF has been a key component and has played a significant role in promoting the province's economic development strategy of stimulating the growth of the information technology sector.

Significantly, only 38% of the funding ($4 414 363) was provided to institutions and companies. The participating organizations accounted for $7 087 104.80 (62%). This was in keeping with the requirement that grantees provide at least 50% of the total investment in any project. In fact, institutions and companies contributed almost two-thirds of the total amount. The grantees were allowed to make in-kind contributions, but these were limited. For example, they had to use the PDF funds to hire new employees or contract out to a private business. They could not use the funds to pay for anyone already on the payroll. The total project commitment was for $11 501 967.80 (Figure 3).

TeleÉducation NB TeleEducation

Programme Development Fund
1993 - 1997

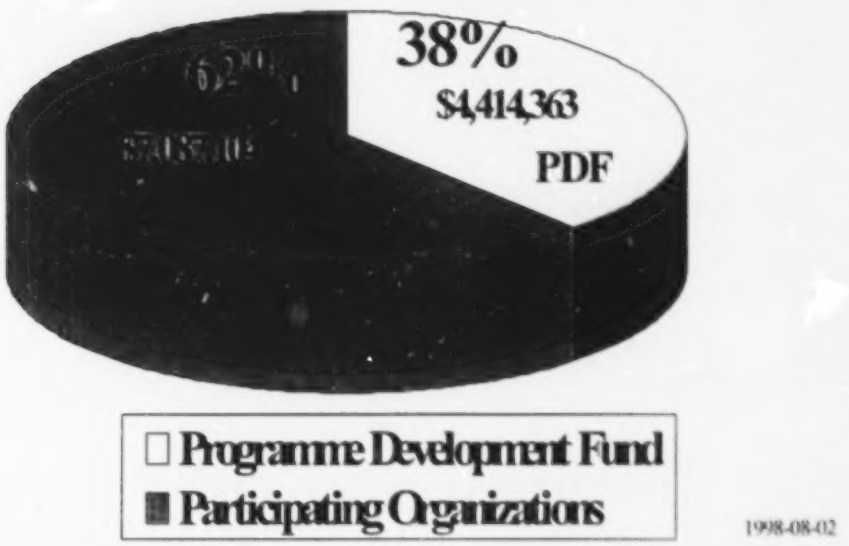

Figure 3. **PDF Funding Sources**

The private sector completed 23 projects (17% of the projects); the Community College 31 projects (23%); the universities 62 projects (48%); Non-profit groups 12 (9%) projects; and the Secondary Schools 4 projects (3%). The funding was similarly divided. The private sector received $1 107 894 (25%); the Community College received $1 090 706 (25%); the universities received $1 637 910 (37%); Non-profit groups received $507 253 (11%); and the Schools received $70 600 (2%) (See Table 1; and Figure 4).

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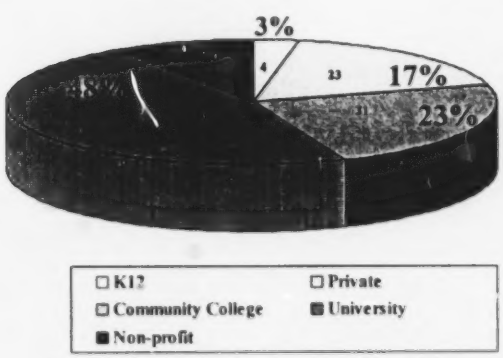
CATEGORY	Courses		Funding	
Private sector	23	18%	$1 107 894	25%
Community College	31	23%	$1 090 706	25%
Universities	62	47%	$1 637 910	37%
Non-Profit Organizations	12	9%	$ 507 253	11%
Secondary Schools	4	3%	$ 70 600	2%
TOTAL	132	100%	$4 414 363	100%

***Table 1*: PDF Project Course and Funding Distribution**

Programme Development Fund
1993 - 1997

Project Distribution

Number of Projects
Total: 132



Funding Distribution
Total: $4,414,363

1998-02-07

***Figure 4*. PDF project distribution**

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The committee managed to ensure participation from both major linguistic groups in the province. There were 75 English language projects (57%), 53 French language projects (40%), and four bilingual ones (4%). Funding of $2 722 245 (62%) went to English language projects; funding of $1 473 053 (33%) went to French language projects; and $ 219 4 (5%) was allocated to bilingual initiatives (Figure 4). The province is approximately 65% English-speaking and 33% French-speaking., so the actual distribution parallels reasonably closely the distribution of the population of the province as a whole.

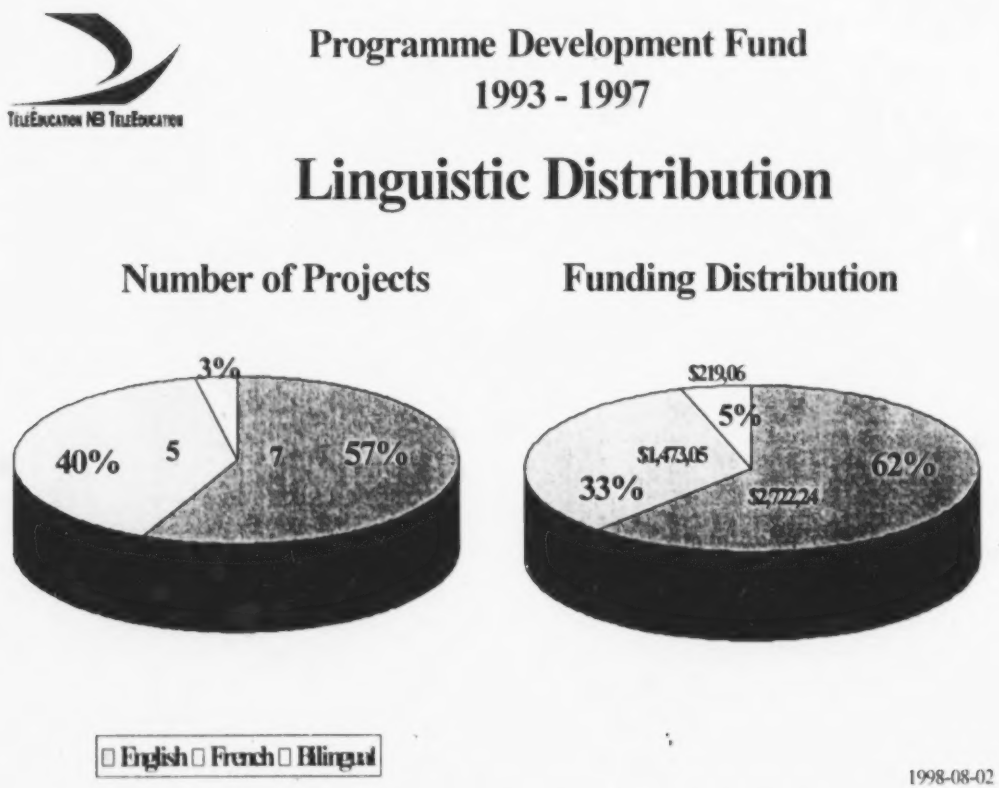

Figure 5. **Linguistic distribution of projects and funding**

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Other highlights of the programme are listed below:

- More than 167 courses have been delivered to more than 4 846 students, primarily at the university and college levels.
- More than 144 full-time positions were directly created through the program, many of which continue on without assistance.
- More than 64 working partnerships were created among different public and private sector institutions and companies.

The PDF funded 132 projects out of a total of 271 submissions. As part of the evaluation process, TE-NB staff requested that all funding recipients complete a form reporting on their experiences. Out of these, 110 participants responded and 22 did not. Four approved projects were never started and eight projects were not completed. From the reports, the following results were tabulated.

As would be expected from funding recipients, they all indicated a high level of support for the program and for its continuation. Nearly all participants indicated that their project would not have been possible without support. Of those who would have done it without PDF funding, many wrote that they would have only been able to do a drastically scaled down version without the assistance.

PDF: Examples of successful companies

A number of companies that received initial funding from the PDF have been remarkably successful. Scholars.com, which was recently acquired by CBT Systems of Ireland, now employs more than 40 people in New Brunswick and has recently opened up an office in Arizona. A statement of appreciation for TeleEducation NB support in helping kickstart their company is posted on their web site <http://www.scholars.com>.

Applied Courseware Technologies employs more than 20 people in the province. It is promoting its marquee products Integreator Pro, and Multimedia Integreator. This company has directly invested more than $1.4 million in New Brunswick. They commented "We are grateful to the PDF whose support has led to our success and continued development of higher level products."<http://www.integreator.com>

CyberDesign is an up and coming company founded by NBCC Miramichi graduates that now employs more than 20 people in the province. The company received early assistance from TeleEducation NB, and the PDF. Their hotel management system, INNSystems80 is becoming very well respected in the hotel industry <http://www.cyberdesign-nb.com/>.

Learning on the Web is a manual for teachers who want to learn how to use the WWW for teaching and learning. It is available in English and French and is revised annually. This manual is recognized internationally as a major resource for teachers and has won star ratings from different search engines including a Blue Web'n award. The French version also received a 5 star rating from a major French-language computer magazine. This manual was created when TeleEducation NB started encouraging PDF developers to put their materials online. The developers, not unexpectedly, asked TeleEducation NB personnel how to do this. They did not know. So, in collaboration with UNB, NBCC Bathurst, and NBCC Miramichi, they studied and experimented and put their experiences into the manual.

Local training companies like JOT <http://www.jot.nb.ca/> and Amulet were able to branch out into CBT and multimedia development with the aid of the PDF. JOT comments that the PDF support "has lead us to a position where we now have 50 IT full time professionals on staff." Amulet has partnered with the Fredericton Economic

Development Commission and the University of New Brunswick in creating The Business Management Skills Centre <http://www.bmscentre.com/>, offering courses online.

Other companies like the Pixel Factory and Innovision (whose members later founded Renaissance Interactive) were given initial boosts by the PDF. The Pixel Factory was mentioned in Financial Post Magazine as one of the top 25 up-and-coming information technology companies in Canada. Renaissance Interactive is known internationally for its Anne of Green Gables CD-ROM, which is available in English, French, and Japanese.

TeleEducation NB, NBTel and a number of NB courseware companies participated in the European Union – Canada Translatlantic "Virtual Resource Centre for Distance Learning for Small and Medium-Sized Enterprises. This involved a proof of concept experiment consisting of a series of videoconferences in which NB companies demonstrated their PDF products to European buyers.

PDF: Project Recognition

PDF Projects completed by public sector institutions have received national and international recognition.

- NBCC Saint John and Fundy Cable partnered with TeleEducation NB to develop Canada's first accredited distance education Registered Nursing Assistant program (DENA). This program won the Canadian Cable Television 1997 Regional Galaxy Award (Excellence in Programming – Education) and won a Conference Board of Canada National Award in 1998.
- Université de Moncton's course *Formation en reconnaisance des acquis* [Training in prior learning assessment] won Le prix de programme exceptionnel de

l'Association pour l'éducation permanente dans les universités du Canada 1995 (AEPUC).

- Université de Moncton`s course *Gestion de la formation à distance* is being delivered to parts of western Canada, St. Pierre et Miquelon, and Rouen, France, as is their MBA at a distance program. These courses are being prepared for delivery through the World Bank`s African Virtual University.
- Mt. Allison's Astronomy course on a CD-ROM has been reviewed and recommended in Atlantic Science, New Scientist (UK) & Astronomy Magazine and been presented at conferences in the Netherlands, Halifax, and at the Canadian Association. Of Physicists Conference in Ottawa.
- La Corporation hospistalière Beauséjour in partnership with the Faculty of Medicine, Université de Sherbrooke, Québec received an award for outstanding presentation of their nutrition program for family practice residents at the 20th Annual Supermarché de pédagogie, Sherbrooke, Québec.
- University of New Brunswick's course *Interactive curriculum courseware on the Internet* won the 1997 Hilroy prize. It is probably the first formal accredited course in Canada to be delivered fully on the WWW. This and other courses supported by TeleEducation NB are being used as part of the Trinidad-Tobago Teacher Training Project.
- CCNB Bathurst`s program in *Bureautique* was showcased at Le sommet de francophonie in Vietnam where it is presently being delivered to government employees. The program is now in demand in many French speaking countries.

- Academic upgrading modules developed by NBCC Moncton and NBCC Saint John are being used by the Beijing Concord School of Sino-Canadian Friendship.
- The *Certificat en gestion agricole* program developed by the Centre de formation agricole at Grand Sault has led their school to be chosen as the Centre d'excellence en sciences agricoles et biotechnologiques (CESAB) which will be a virtual center focusing on online delivery of programs.
- NBCC Edmundston, one of the first to obtain PDF funding for their hospitality program, now trains restaurateurs in France, using audiographics, and the WWW.

PDF Benefits

Startup Funding

In explaining their success, private sector companies emphasized the importance of these funds during their startup period. "This project has given this company the ability to survive some of the growing pains of a new company, and to learn through the experience" noted one company. The PDF project was sometimes not the one that made them successful, but rather the one on which they cut their teeth and learned some hard lessons. The PDF project was often the one successfully used to promote their capabilities and attract investment. It gave some companies the boost that they needed to enter the CD-ROM and online training business.

Many companies commented on the relationships established with other companies when learning how to export their products. Some products have been marketed across North America, like JOT's *Tryometry* CD-ROM. Forsgren & Associates developed quality training packages for distance education using videoconferencing. These packages became known and the company was contacted by various customers to develop similar products. One company noted that relationships with other enterprises has led to "spin off"

benefits. For example, companies have negotiated contracts with out of province organizations for creating educational modules. As a direct result of their PDF project, NB companies have gained a reputation as leaders in online course development.

The initial funding provided by PDF was crucial for many of the small companies, and for initiatives in public institutions. Without the funding, DE would not have happened. In addition, the PDF has created an industry.

> The Third Age Centre has been offering courses using the TeleEducation NB network for the past two years. The PDF sponsored the development of a course in Medication Self-Management Skills for Older Patients. These Medication Review Clinics have been offered to elderly people throughout the province focusing on one disease-specific medication at a time. The course not only educates patients on how to use their medication, but also serves to bring people with similar conditions together.

Collaboration

Other organizations stress the value of their partnerships, which they claim have opened doors to new opportunities that they would never have known about otherwise. In particular, both public, non-profit, and private sector organizations mention that the PDF has given them their first experience with public/private sector partnerships. For example, the Emergency Measures Organization contracted with First Class Systems to build their *Orientation to Basic Emergency Preparedness* course. A national version is now being prepared by Emergency Preparedness Canada. Saint John Ambulance who partnered with Applied Courseware Technology is also working with their national office to develop their *Standard First Aid* course into an internationally marketable product.

In the larger public institutions, the PDF project has facilitated collaboration among different departments. In the community college, different campuses worked together on academic upgrading. At UNB, professors in different departments have begun collaborating. For example, the department of Forestry is working with the School of Management Engineering on adapting their online management course and with the UNB library to create a generic information retrieval system.

Public sector institutions also profited from the new relationships they developed with other institutions across the country and internationally. UNB's department of Geology claims that due to their PDF-funded GIS (Geographic Information System) training project, CARIS GEMM, a GIS product which they developed, is now being adopted by a growing number of geology departments in North America. The UNB department of Education feels that the Trinidad teacher project flows directly from leadership in developing online courses. The UdeM now enjoys a partnership relationship with the Conseil régional de Picardie in France as a direct result of its involvement with TE-NB in PDF course development. The NBCC St. Andrews is now working at the national level in the tourist industry, thanks to contacts made during the development of their hospitality course.

The East-West Project involved collaboration among four Canadian provinces (Alberta, British Columbia, New Brunswick, and Newfoundland) to develop a course in Information Technology. The course modules are being used by institutions in many different provinces and abroad. The project was led by TeleEducation NB with financing of $240 000 from Industry Canada. The reputation for course development because of PDF gave us the credibility to be perceived as leaders not only by Industry Canada, but also by the other provinces.

Experience

Both public and private sector organizations commend the PDF for "building a pool of expertise where none existed before." These locally trained cadres of trained course developers and programmers continue to work in the field. This expertise also extends to management skills that have been learned often through the crucible of the bleeding edge.

The public sector strongly emphasises how the PDF projects have helped to sew interest among their staff. "It blazed a trail for others to follow." They claim that the funding allowed their institutions to move towards multimedia earlier than would have been possible otherwise. Institutions are generally too conservative to experiment with different pedagogical media. It was too risky to attempt without the additional support provided both by the funding and by the TeleEducation NB team. For the vast majority of institutions, the PDF project was an agreeable first experience that has led to greater participation by faculty. In addition, in at least one department, the PDF project brought important educational issues to the fore, forcing faculty to address problems that they would otherwise have preferred to avoid.

Continued development

The early PDF innovators are now used as resource people by other faculty within their institutions. Valuable lessons learned in the initial project pertaining to WWW course structuring, graphical layout, instructional design and other aspects have been passed on to new developers. Some institutions have kept on the youth that were employed as technical and graphical support personnel in order to provide continuing services to staff who are developing other modules. In UNB's Faculty of Forestry and

Environmental Management, the PDF project stimulated the development of an online encyclopaedia of Forestry, allowing the professors to design and develop a whole program as well as its component parts. To further this initiative, the Forestry Faculty has hired a distance education coordinator.

Some institutions mention how their participation has led to the development of further courses without funding from PDF. The initial project served as an example course for others to imitate and improve upon. District scolaire 11, for example, claims that the project led directly to the development of other distance education courses in *espagnol, allemand, mathematics, and français.* In addition, many institutions noted that they continue to develop, refine and integrate the modules already created. The Program Review refers to this continuing development engendered by the PDF as having contibuted to the economic development of the province.

> The PDF has funded both the UdeM and UNB library assistant training programs. This has helped our institutions to improve the job performance of library assistants in small communities around the province, particularly focusing on information technology skills. In addition, TeleEducation NB has promoted more open access to the libraries by actively supporting UNB's WWW library service, which provides province-wide access for students to the UNB library catalogue and to a number of different research databases.

Long term effects

This continuing development is creating a courseware industry in the province that in the long term will be self-sustaining. On interviewee noted that the critical start-up help for new small companies can translate down the road into businesses contributing millions of dollars to the NB economy. Without the initial funding from the PDF, the industry would never have got going in the first place. If one looks back to where the courseware

inustry was in NB five years ago when the PDF was first put in place and see where it is now, there's an immeasurable difference.

PDF application procedure

In this period, the PDF application was paper-based. The most typical comment from applicants was that it worked very well. In the Program Review survey of respondents (29 out of 61), 90% of them were either very satisfied (45%) or satisfied (45%) with the service provided by TE-NB staff. 79% of respondents reported receiving personal feedback during the processing (74% verbal, 26% written).

The few complaints centered on the time delay between the initial recommendation of the project by the PDF committee and the delivery of the first check. This too often stretched into months. The Program Review survey indicated that processing took longer than ten weeks for 38% of the respondents. For 21%, processing took from six to eight weeks, and for 14%, it took between four and six weeks. Private sector companies were more vulnerable as the public sector institutions could often commence their projects based on the recommendation knowing that the funding would be forthcoming before the end of the fiscal year.

Other users mentioned the complications involved when they were asked by the committee to make revisions to their proposals. Nevertheless, the vast majority of participants were very satisfied with the program procedures and urged that it be continued in more or less the same form.

PDF problems

The respondents to the survey identified problems in the development of the projects as well as obstacles in delivering the course at a distance to be the major source of

problems. As the people involved were newcomers to both course development and the distance delivery of courses, this is not surprising. The majority of the responses to the survey stressed the persistence of development problems, which they claimed were due to poor finances, the heavy workload, and problems associated with administration. The delivery problems were primarily due to irritating technical glitches especially in the early stages of the implementation of the TE-NB network. Marketing was also identified as a major problem area by a significant number of respondents. A small number identified difficulties in evaluating their work as being significant.

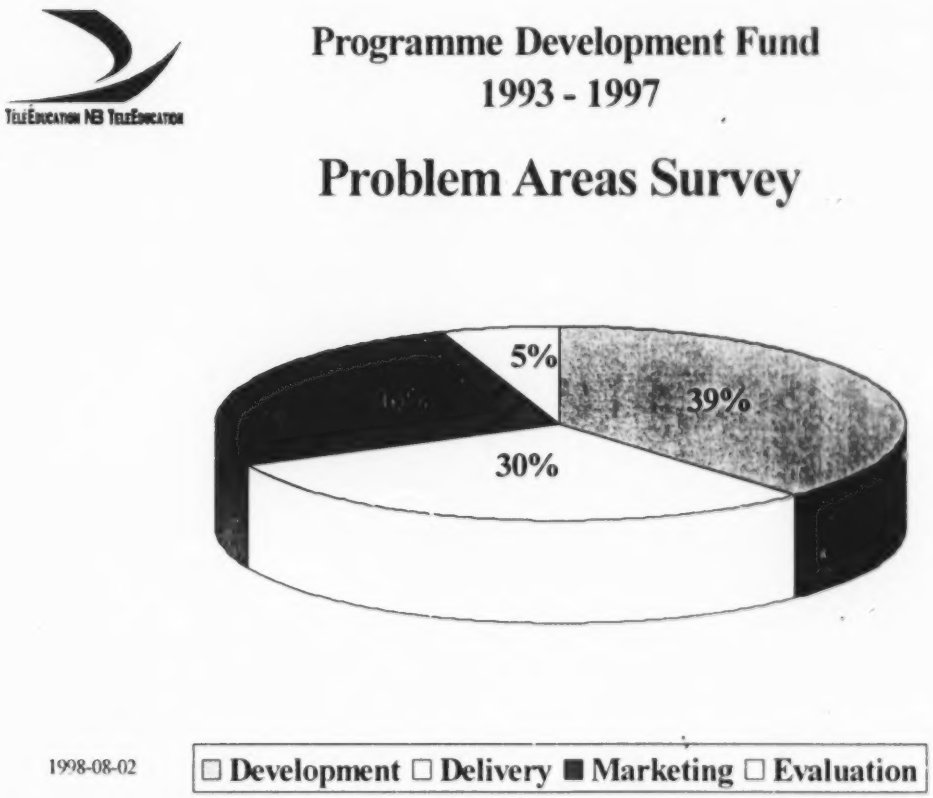

Figure 6. **PDF problem areas**

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Financial

Private sector companies and some public sector institutions mentioned that they ran short of funds before they could finish. The effort and costs associated with revising original materials and adapting them for the new media proved to be greater than some first estimated. They felt that with additional capital, they could have done a better job. Others were forced to considerably reduce the scope of their project due to budgetary constraints.

Heavy Workload

Because of their lack of experience, participants often had unrealistic expectations regarding the amount of work involved in completing their projects. Out of frustration, one instructor complained that the amount of work required for course preparation outweighed the benefits of the course. Related to this were several complaints about the need for more support, more time, and more experience.

> Optimum Translation, a local NB company was given the contract to translate all the modules developed in the East-West project. This involved the direct translation of the modules in HTML format for the WWW. They were among the first companies in the world to do this. The expertise and the reputation that followed from this know-how has led to many more opportunities for the company, including winning the contract to translate McLelland-Stewart's *Canadian Encyclopedia* CD-ROM.

Administrative

Developers in public institutions complained about the lack of support from their administration. One declared that he would not be first again because of the administrative red tape that he had to overcome just to get started. University professors complained

about the lack of recognition for their efforts in promotion and tenure evaluations as well as the lack of compensation for their extra labor. Another professor complained about the difficulties working with his colleagues. Others noted particular difficulties when they changed curriculum in mid-stream.

Technical

Some of the public institutions had major technical problems in the delivery of their courses using the audiographic network. They cited the difficulty of learning how to use the new technology and the many glitches causing delays in the classes. Significantly, a much larger number of users were very appreciative of the system. It was evident that the technological complaints came from the earliest users who were the guinea pigs in the new network. Later starters gave much higher ratings to the technology. Whatever the complaint, the response to technical difficulties has not been to give up or even back off, but rather to fix the problem and make their courses work better.

Some institutions complained that the necessary equipment was not available either for development or for delivery. This was a common complaint when the network was beginning. One instructor complained that the technology was a barrier to learning. One developer noted that the technological problems involved in the design of his product caused significant delays. Another noted that he developed on a proprietary platform that was not widespread and so his product could not be used.

Others were distraught at how fast the technology was changing. The platform they chose to start with was already outdated by the time they finished. In the Program Review, 31% of respondents indicated that fast technological change caused problems for them in the development process.

Marketing

Many respondents identified marketing as a major problem. Very few of either the public or private sector organizations paid enough attention to how they would sell their product once it was developed. The "field of dreams - build it and they will come" mentality was pervasive. Many conducted needs analyses and determined that there was a general demand for their particular course. However, few managed to extend that analysis further to see if those needs could be translated into a marketable commodity. Some institutions involved in academic upgrading, high school level courses, for example, correctly analyzed a need, but did not go further to determine what price level could be supported. They offered the course for a higher tuition than the targeted students were able to pay. Others in both public and private institutions felt that all they needed to do was develop a quality product. Many public institutions were satisfied with their product even if it was only delivered to small groups of students.

The Internet listserv *WWW-DEV* is being run from UNB's Continuing Education Department. It is now one of the most active listservs available online for course developers, hosting more than 2 000 subscribers from over 20 different countries. The listserv also hosts the annual NAWEB conferences at UNB which are attended by serious course developers from across North America with some overseas visitors. This listserv and conference which focuses international attention on NB, grew out of a collaboration between UNB and TeleEducation NB in creating the *Learning on the Web* Instructor's Manual for the use of PDF project developers.

In the Program Review, 38% of respondents indicated that they had not done any marketing. Those that did referred to minimal efforts in newspapers, on radio or television, and at conferences. Many were still in the developmental stage for their courseware, but it is still significant that very few took marketing seriously from the early stages.

Other Problems

A private company wrote that competition from freeware and shareware forced him to drastically alter his plan before completion. Only one project was affected because of a sickness of one of the principal developers, which delayed the completion of the project for several months.

Recommendations from participants

Participants recommend that developers must first get their financial house in order and base their strategy on a comprehensive business plan. They further stress the need for a real commitment by the team that is essential for overcoming many of the organizational and logistical problems that can occur. Upgrading the technology can become a serious obstacle, so they recommend building for the future while allowing sufficient time for the project. Finally, they recommend that a good marketing strategy must be developed at the beginning of the project.

Financial

At least one company insisted that developers should secure their capital input before embarking on a major project. Certainly, everybody should be careful not to "bite off more than they can chew" and feel comfortable with the funding that has been allocated.

Planning

After marketing, the strongest recommendation was for a solid business plan before starting, combined with a hands-on approach when underway. Realistic schedules must be formulated and stuck to. The plan must be formulated in consultation with the full development team, including the content specialist, the instructional designer, graphic designer, and programmer. (These roles may be combined.). Success should not depend too much on one person. NBCC's award winning RNA program's success has been attributed to good up front planning with all players at the table.

Commitment

Many participants stressed the need for strong commitments from all partners in a project. Private sector companies complained about institutions not delivering the course when developed, because they initially had not fully "bought-in". Public institutions complained of private companies not delivering on what was promised. Some who thought they had agreements for receiving sites found that their partners had backed off either through a genuine misunderstanding or because of changes within the organization. Both sides agreed that a strong commitment from all players, along with precise descriptions of their roles and responsibilities, was crucial in order to avoid needless delays or major blockages. These should be detailed and signed off prior to commencement.

Public institutions also complained about the lack of commitment from their own administration. Many had to suffer through either the reassignment of personnel or changes in responsibilities for their key developers. Others could not get their institutions to offer the courses after they had initially agreed do so. In still other cases, the curriculum was changed unilaterally. Before committing, project principals must ensure that adequate resources will stay in place for the duration of the project.

Organizational Issues

There was general support for the use of multi-disciplinary project teams that could focus uniquely on the project for a long period. It was noted that there are many more people who understand multimedia and the World Wide Web available now than when the PDF began a few years ago. One administrator recommended that instructors should be involved more in the graphics and Web creation and not just in developing the web content. He felt that in this way, the institution could benefit residually from the experience gained by the instructor.

> Burnt Church First Nation, in collaboration with a local company, developed a CD-ROM for teaching MicMac culture. This CD-ROM was highlighted at a major Canada-wide videoconference "Across the North" , and was viewed by native groups in the Northwest Territories and the Yukon. The Burnt Church motto was "From beaver chips to microchips". Their example stimulated many other aboriginal organizations to go forward and explore multimedia distance education. The multimedia course was delivered to three reserves in the province. Unfortunately, despite the success of the course delivery, there was no commitment from the band council and the course was discontinuted.

Upgrade technology

The PDF began before the World Wide Web became known and widely available. The first projects were developed for audiographic, video or other forms of teleconferencing and for CBT on CD-ROM. Most of these early participants now recommend development directly for the WWW. They mention the great difficulty in keeping up with the rapidly changing technology. One participant developed a DOS product because when he started, only a few schools had Windows compatible computers.

However, by the time he was finishing, the schools would no longer even accept DOS programs. It is recommended that developers build for the most up-to-date technology, assuming that by the time it is finished, it will be readily available. At the same time, it should be backward compatible, so that it can at least work on the older systems albeit with some features lacking.

Time Available

A common recommendation was to realize that development takes far more time than one expects. Some say that when you are 95% complete, you are half way there. They suggest planning to develop fewer modules in the same time period and allowing at least one year for development and testing. One developer recommends not delivering a course until the material has been properly tested.

Marketing

Grant recipients strongly recommended a greater emphasis on marketing. If anything, the need to do thorough marketing from the very beginning was the premiere lesson learned by the participants. They opened their eyes to marketing seeing it as senior management responsibility. They called for better marketing support from their institutions and from collaborative organizations and partners. They stressed the need for a marketing study and strategy development even before embarking on a project.

Recommendations included ensuring that the technological delivery platform was receivable by the target market members. For example, one company developed Computer Based Training for groups that did not have access to personal computers. One company recommended developing specifically for the corporate market rather than for individuals. Another suggested that a corporate commitment for a significant number of seats in a course would not only guarantee some vital initial funding, but also add

credibility and legitimacy to the program. Others advised chasing after one market at a time, and not being "all over the map". Some suggested that any course could be better marketed when it forms part of a program. "Orphan" courses that do not lead to any certificate or diploma are particularly difficult to sell.

A few companies advocated making courses much more generic for the widest possible audience. Less specific courseware that is purged of localisms is easier to export. Courseware should be designed in modules from the beginning with design elements to facilitate the easy substitution of other languages, other local features, other industry jargon etc. A modular packaged format also helps to lower production costs. A few participants regretted not being more open in their design, especially for translation to other languages.

Impact

Besides the increase in accessibility to distance education opportunities for students and the experience gained by instructors and developers from the course development projects, the major impact of the PDF has been in facilitating change in our public institutions and private sector training companies. The fund has promoted a greater degree of openness to new ideas and fresh approaches. PDF developers were the pioneers who spearheaded multimedia distance learning in their institutions, opening up new possibilities and new horizons for faculty.

TeleEducation NB Course Template and course development standards are being used by many organizations across Canada and internationally. The standards grew out of the East-West project. The template was developed by Intratrainment Inc., a local NB company with assistance from the PDF. Course developers are asked to take a close look at the standards and use the template to shorten their development time.

The PDF initiated teachers and students in the new realm of technology and served as a model and as a stepping stone to more advanced work. Today, for many instructors in our institutions, multimedia and the WWW are normal features of their teaching environment. Many courses are now being "mediatised" with little support needed from TeleEducation NB. Generally, the PDF participants are continuing to improve their courses, making them more sophisticated, both pedagogically and technologically. Importantly, they are constantly upgrading their skills and continuing with partnerships that help to develop the advanced training technology industry in the province.

The PDF project in many institutions laid the groundwork for a higher level of multimedia services. One Mount Allison University PDF developer commented "Probably this product, more than any other, spurred MtA into various ventures in technology enhanced teaching including the Centre for Learning Technologies, the Task Force on Teaching & Technology, and the Wu Teaching Centre." These are in reference to new initiatives at the university. "Distance education is becoming a priority at MtA directly due to PDF grants."

A private company claimed that the creation and implementation of three distance diploma programs is a direct result of their experiences with the PDF. The PDF project also stimulated the creation and installation of more advanced physical infrastructures in many institutions.

Economically, nearly every dollar spent was in salaries to personnel involved in course development in the province. More than 150 new jobs were directly created and many more came indirectly. Scholars.com, ACT, JOT, Amulet, CyberDesign, Renaissance Interactive, Pixel Factory and other small companies together, now employ more than 150

people on an ongoing basis. As an example, ACT claims that since their startup which was critically aided by the PDF, they are responsible for the injection of a further $4 million into the NB economy. Other companies refer to the PDF allowing them to maintain employment at critical periods. Some refer to the benefits of employment in their particular region.

The PDF also made distance education and multimedia more visible, making it more acceptable to organizations. This has helped solidify support for the province's economic development policy of selling NB as a test bed for new advanced training technology applications.

As TeleEducation NB continues under the Regional Economic Development Agreement, the new PDF has changed to respond to the lessons learned and to build on these early experiences.

Telecampus PDF

In 1997, the CAEHRD agreement expired and further funding was made available for the PDF through the Regional Economic Development Agreement (REDA). Like its predecessor, the the Coordinating Committee of REDA administered the fund for the federal government represented by the Atlantic Canada Opportunities Agency (ACOA) and for the provincial government by the Regional Development Corporation (RDC).

In this agreement, $3.6 million was made available over three years. TeleEducation NB continues the responsibility for processing the proposals, consulting with applicants, and monitoring the projects. This new iteration of the PDF continues to support the provincial policy of assisting in the development of the advanced training technology sector. By supporting projects, the PDF will contribute to the establishment of

a critical mass of new commercially viable training products and services available for export online.

The TeleCampus PDF is seen as a continuation of the old PDF with the following significant changes. The Review committee now has an equal number of private and public sector members. Previously, there were more public sector representatives. The funding maximum has been increased to $100 000 from the previous limit of $75 000. More importantly, based on the recommendations of previous participants, there is a new requirement: the submission of a solid business and marketing plan for export of the products and services developed. There is also a stronger emphasis on assessing the potential for ongoing economic benefits to the province.

In order to facilitate the application process, an online form has been created which guides the applicants through the questions. This makes it simpler for applicants and for processing by TeleEducation NB staff.

Conclusion

The vast majority of the recipients were very satisfied with the program procedures and appreciative of its many benefits. While some felt that a stronger focus on exportable, potentially profitable projects was needed, they still urged that it be continued in more or less the same form. The PDF has provided NB institutions and companies with a gateway to the new advanced training technologies industry. As a significant component of the province's economic development strategy, it has played a major role in positioning New Brunswick as a world leader in this increasingly important business sector.

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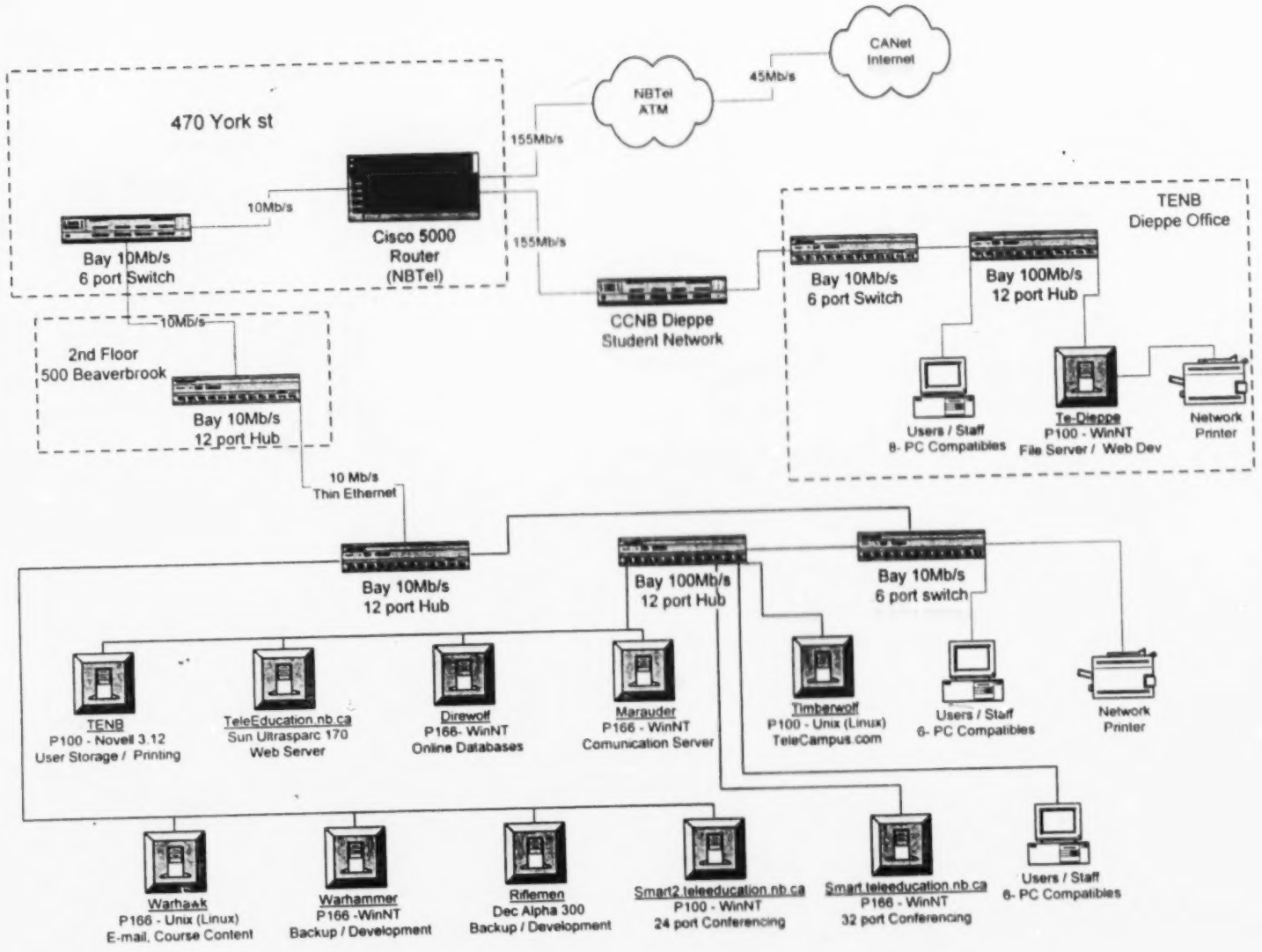
Appendix A: Learning History of the Programme Development Fund

This learning history of the PDF has been created so that participants in the initiative and others who might want to copy it will have a better understanding of what happened and which issues are important. It is hoped that through this process, TeleEducation NB (TE-NB) and PDF will have a better understanding of what happened and why. Hopefully, this will help participants to determine what to do next and help others to avoid mistakes and focus on what works.

This methodology has been freely adapted from George Roth's Learning History approach. More information on this is available on the World Wide Web at <http://ccs.mit.edu/lh/overview/>. The modifications in this version include an attempt to get a solid overview of the entire implementation rather than focusing on any one critical episode or episodes. The jointly-told tale is based on the ancient practice of community story-telling. The right-hand column is reserved for direct quotes from participants and the left-hand column contains analysis and commentary by the researcher. It is hoped that apart from providing valuable generalizable knowledge to the DE community, this learning history will build trust among TE-NB participants, raise important issues and inform those interested.



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			app							paym
0010	E-COM	Web Based Training for the Certified Planner Designation	$100 000,00	$50 000,00	$50 000,00			$ 50 000,00		
0027	The Pixel Factory Inc.	Canadian Securities Course	$45 000,00	$22 500,00	$22 500,00			$ 22 500,00	$18 000,00	
0006	Knowledge 3000 Corp.	TAUT Teaching Adults Using Technology	$20 000,00	$10 000,00	$10 000,00			$ 10 000,00	$8 000,00	
0011	UNB	Transportation Education by the World Wide Web	$100 000,00	$50 000,00	$40 000,00	$10 000,00		$ 50 000,00	$0,00	
0019	Nuratek Enterprises Inc.	Médiatisation de cours du programme Webmaster	$95 200,00	$47 600,00	$47 600,00			$ 47 600,00	$38 080,00	
0024	Université de Moncton	Formation accessible aux cadres en exercise en régions éloignées	$77 000,00	$38 500,00	$38 500,00			$ 38 500,00		
0022	UNB	UNB Trinidad and Tobago Teacher Education Project	$100 000,00	$0,00	$100 000,00			$ 50 000,00		
0035	Roy-Babin Multimedia Production	Towards an On-line Memory School	$92 250,00	$46 125,00	$46 125,00			$ 46 125,00		
0049	Amulet Consulting Ltd.	Business Management Skills Centre	$100 000,00	$50 000,00	$50 000,00			$ 50 000,00	$40 000,00	
0029	JOT Inc.	Continuous Adult Learning Model for Information Technology (CALM-IT) Project	$100 000,00	$50 000,00	$40 000,00	$10 000,00		$ 50 000,00		
0041	Sapience Educational Systems Inc.	Uniformed Security Officer Course	$70 000,00		$70 000,00			$ 35 000,00	$0,00	
0045	Indipro Systems Inc.	IP Designer Software Application User Training	$80 000,00		$80 000,00			$ 40 000,00	$0,00	
0066	CCNB Bathurst	Médiatisation-Récepteurs AM et FM et magnétophone	$99 200,00	$49 600,00	$49 600,00			$ 49 600,00	$0,00	
0074	CCNB Bathurst	Médiatisation-Téléviseurs	$99 199,00	$49 599,50	$39 679,60	$9 919,90		$ 49 599,50	$0,00	
0057	St Thomas University	On-line Professional Development Series in Criminal Justice	$98 000,00	$49 000,00	$39 200,00	$9 800,00		$ 49 000,00	$0,00	
0048	Applied Courseware Technology Inc.	Introduction to Instructional Design & Designing Web Based Training	$100 000,00		$100 000,00			$ -	$0,00	
0075	Vital Knowledge Software Inc.	Professional Development for Modules for Teachers - Series Completion	$81 785,00	$49 892,50	$49 892,50			$ 49 892,50	$0,00	
0058	Silver Fox Developments	Psychology of Learning: Prediction and Control of Behavior	$45 555,00		$45 555,00			$ 22 777,50	$0,00	
0090	Certifyonline.com	WEB Based Certification training for JAVA	$85 000,00		$85 000,00			$ 42 500,00	$0,00	
0095	Université de Moncton	Formation de deuxième cycle en éducation	$100 000,00		$90 000,00		$10 000,00	$ 50 000,00	$0,00	
0067	Partnership - CCNB Campbellton & Nuratek	Formation en ligne dans le secteur du bois ouvré	$93 500,00		$93 500,00			$ -	$0,00	
			$1 781 689,00	$562 817,00	$1 187 152,10	$39 719,90	$10 000,00	$ 803 094,50	$104 080,00	

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Learning History

The PDF was established to support the development of multimedia educational content for DE. Through this support, institution could get funding for adapting their courses for DE delivery and small local companies could gain experience and seed funding for projects. The aim is to build up the advanced training technology sector of the provincial economy.

PDF seeds a new industry.	PDF2: I think it's going to be harder to identify the long term benefits, simply because companies tend to not to need that type of assistance as they get bigger. As they go on their own, everybody likes to think that they got to that point [success] by themselves. But, I think if you look back right to the very basic building blocks, PDF support was an essential part. Somewhere in the very beginning they had an awful lot of help to get started. And that's where because of a few dollars invested in that firm today, ten years down the road that firm may be contributing a million dollars worth of business. But, without that investment at the beginning, the company would never have been able get going.
Purpose	TCC1: The purpose of the PDF is to encourage content development of the learning material at a distance. This allows companies to lessen their risk
PDF now insists on an export business plan.	TCC2: PDF helps the small companies to start up. It now has moved towards more emphasis on developing interprovincial and international relationships related to content, products, and services. So there's been a significant change of emphasis. PDF also helps in developing partners either private public partnering or private companies talking with educational institutions. Student 2: PDF promotes information technology, keeping and creating jobs. PDF1: PDF supports the development of exportable content.

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Effectiveness	Staff 2: The first huge step that we have provided [through funding], has been key to many players. PDF2: The PDF has been effective with its support to a large degree, of companies like our own in being able to offer some funding for projects. TCC2: Companies are able to sell and export those PDF-financed products. Some have been incredibly successful. There are other success stories. PDF1: If it was to create an industry, well I think that the first program was very successful. In our case, it certainly provided seed money for developing capacity. It overwrote the costs of developing experience. The PDF contributed to building capacity in companies in New Brunswick
Satisfaction with the PDF process.	Student 2: From my experience, the PDF is accessible and the criteria are clear. As soon as somebody has a project or an idea it can be easily put into the system. The committee judges that to see if it's exactly within the criteria. It's quite a good tool I think to develop a project.
Is it too early to tell?	TCC1: I don't think that we'll be able to tell until a year at least a year. A success factor will be in terms of the marketing
Educational enrichment *How do you measure informal learning?* *The creation of a cadre of networked professionals.*	PDF2: I can train 50 people but nobody knows I trained those 50 people. Other developers would come to our site to learn particular aspects of development that would help them. They would pose a question and one of the guys would answer. It" a form of online training. Now there's any number of private and public groups in the province that are developing training that you could e-mail and ask how did you do this. Somebody will sure enough reply something back. Well, that's training.
Marketing of DE in NB through the PDF.	PDF1: It has created a huge awareness of the potential of DE. It has enhanced programs. TCC2: The universities have opened their eyes to private business.
Economic impact	TCC2: PDF has had an incredible positive impact on institutions and private companies – another success story.

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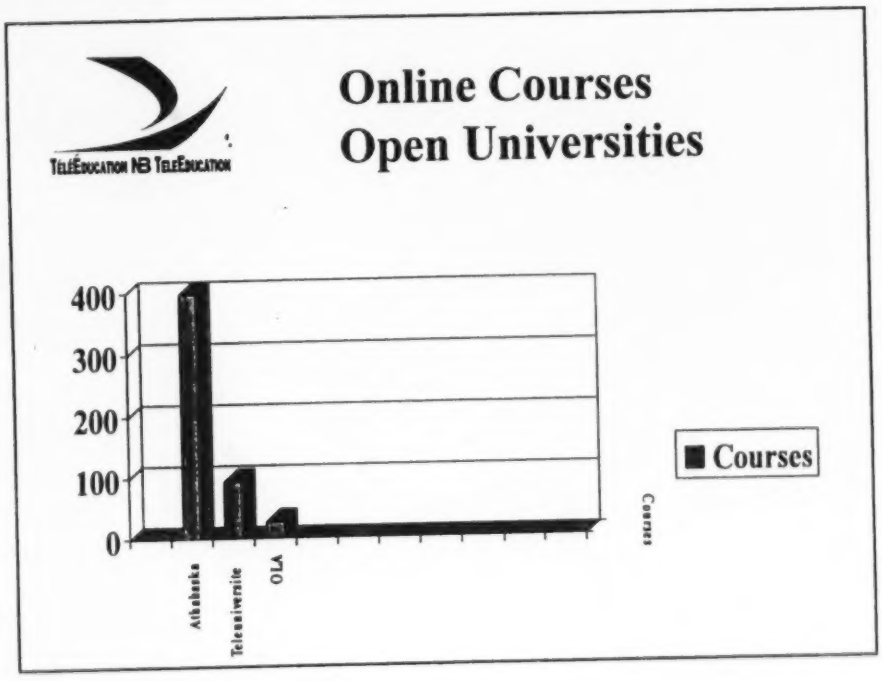
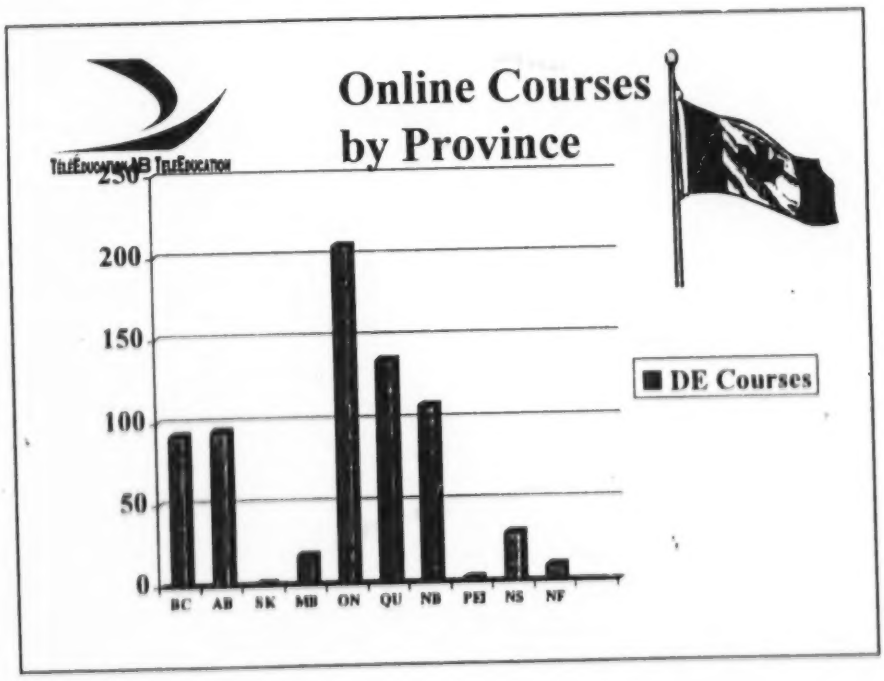
	PDF2: New companies and private institutions are becoming more confident in what they can turn out. Companies that are in the province now are well on their way.
Direct success. Association with TE-NB gives credibility to small NB companies, who benefit from TE-NB's reputation.	PDF1: PDF has built the capacity of local companies who have built a pool of experience in course development. Lcal companies now have this pool of people, which is a big selling feature. It has drawn lot of attention to New Brunswick. Our company is continuing to develop courseware and training programs. PDF really helped in the development of our company. In 1993 the PDF helped start the company, and for the next 12 to 18 months initially helped build up the capacity. We got larger projects after that because of this. We were invited to bid on projects that we would never had otherwise been invited to bid on which amounted to millions of dollars. We won a two million dollar project.
Revenue and jobs.	PDF2: For our company it's played a very crucial role allowing us to maintain employment. It has helped us to bring revenue back to the province. Instructor 2: A project was put it into effect entirely in our region. So it's quite important for job creation in different regions of the province. The first small project was not much in terms of training. However if we go on to a successful career together with Major Company X in development. That could mean fifteen, twenty million dollars over the next ten, fifteen years. While initially that would never have happened unless TeleEducation got involved.
Marketing know-how.	PDF1: Developing two or three courses that we can actually deliver ourselves enhances our capacity. Moreover, you don't have to capture a large portion of the market to have it translated into large dollars. The development of relationships with insitutions is vital. Modest amounts of money will help to facilitate that.
Expanding awareness.	PDF2: It's not just the problem of creating a course, but how to market it afterwards. The product can sit on the shelf and gather dust and never really go anywhere. We need to have a mechanism to give the companies the support they need to get out marketing strategies.

	TCC1: The PDF has changed the mind set of this province regarding the IT industry. Just thinking and opening up and thinking on that level has been tremendously successful. PDF1: In terms of creating awareness then, the program was extremely successful.
Future effects	
How important is the shift in people's attitudes?	TCC1: We will slowly but surely create an industry that is self sustained, and is more long term PDF2: I think that the effects are not short term. People are looking at the whole industry. It is going to be very long term, where maybe ten years down the road you will have those companies that are here, that were created here. I think when TeleEducation was created, six months to a year after it was created it's pretty difficult to say what kind of impact it had on this province, but if you look at it now compared to then there's an immeasurable difference of what it's meant to the people of this Province.
PDF strengths	
The PDF online application process is well regarded.	Student 2: The PDF allows organizations to put their ideas, into effect. If you have a good proposal, a good idea, if you meet all the criteria then it gets supported. PDF1: The fund is open and flexible. Excellent support and cooperation. Nothing but good to say.
TE-NB as a neutral agency.	TCC2: Staff assist new firms or small businesses to fill out the application
	PDF2: The PDF provides a support mechanism for the companies that are starting. TeleEducation is not as attached to the industry as people in the industry so they can have a more objective view as to how things are happening.
PDF weaknesses	
Who is checking?	PDF1: There are a huge numbers of hoops to jump through. TE-NB needs to modify the PDF criteria so that it's much more market-oriented. PDF needs accountability for putting checks in place of advancing the funds and then measuring the results.
Administrative problems	
	PDF2: PDF is growing like the rest of us and so it's making mistakes but it's backing up and trying to correct them.
When the business plan is not good enough to be accepted by PDF, should we still accept	TCC2: It is important that the ones signing the checks

a good project?	don't have too much control. Is it fair to select a project on the basis of money when you are bombarded with incredible ideas just because it doesn't match a particular set of criteria that was preset?
A public/private sector agreement went sour. Support was not really there.	PDF2: The difference in the speed the private company has to work at, as opposed to the speed of the government, is a problem. In the private sector decisions have to be made really fast. It's going to require a lot of team work on both sides to solve this.
Future of the PDF	PDF1: I'm not sure that all the administrators in the public institutions were really on the band wagon. PDF1: Online course development is growing. All the world is on the band wagon developing content and courses and programs for export. Two or three will dominate in development and delivery of particular programs at a distance. We should focus on programs where we currently have a real advantage, partnering between private institutions to public companies. We can use the local market to build a critical mass so we can then market globally.





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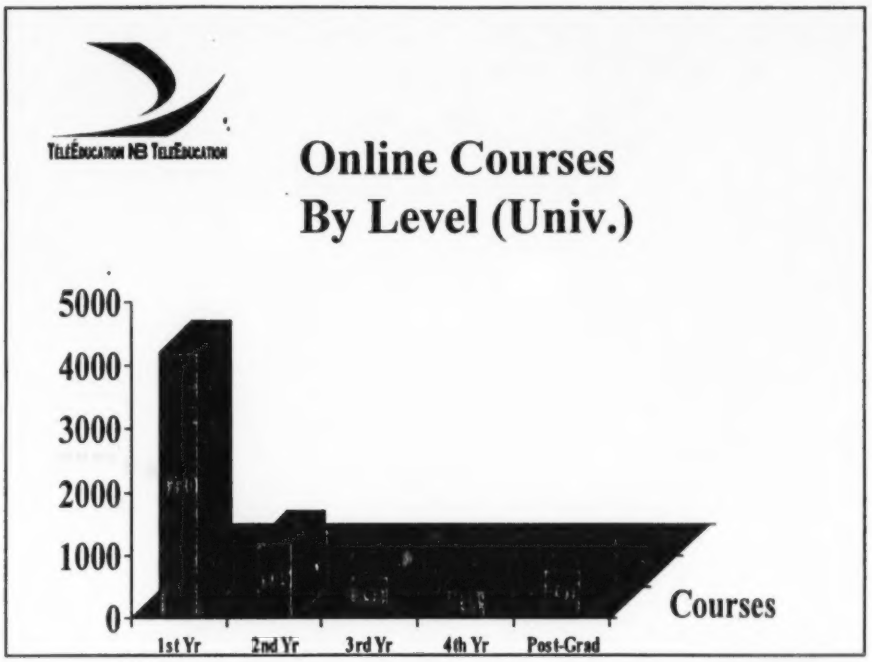
TeleEducation NB TeleEducation
Online Courses
By Level (Univ.)
5000
4000
3000
2000
1000
0
1st Yr
2nd Yr
3rd Yr
4th Yr
Post-Grad
Courses